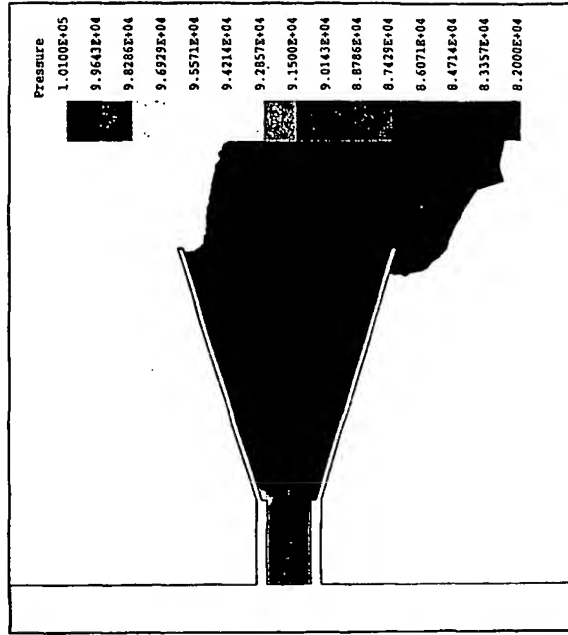


FIG. 1

95



AC

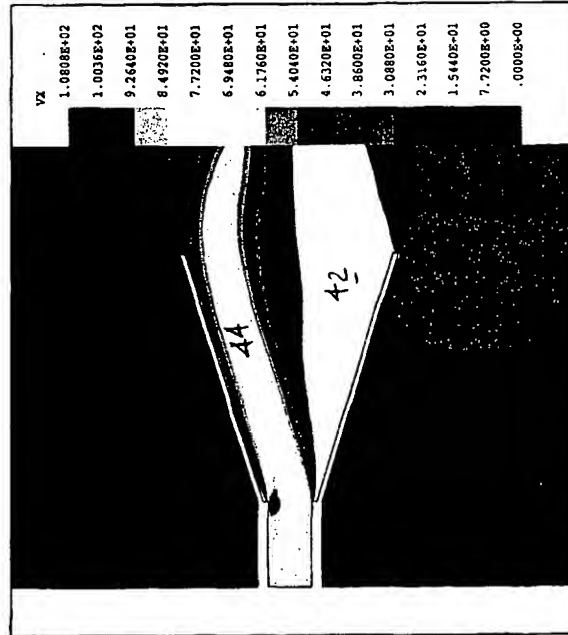


FIG. 2

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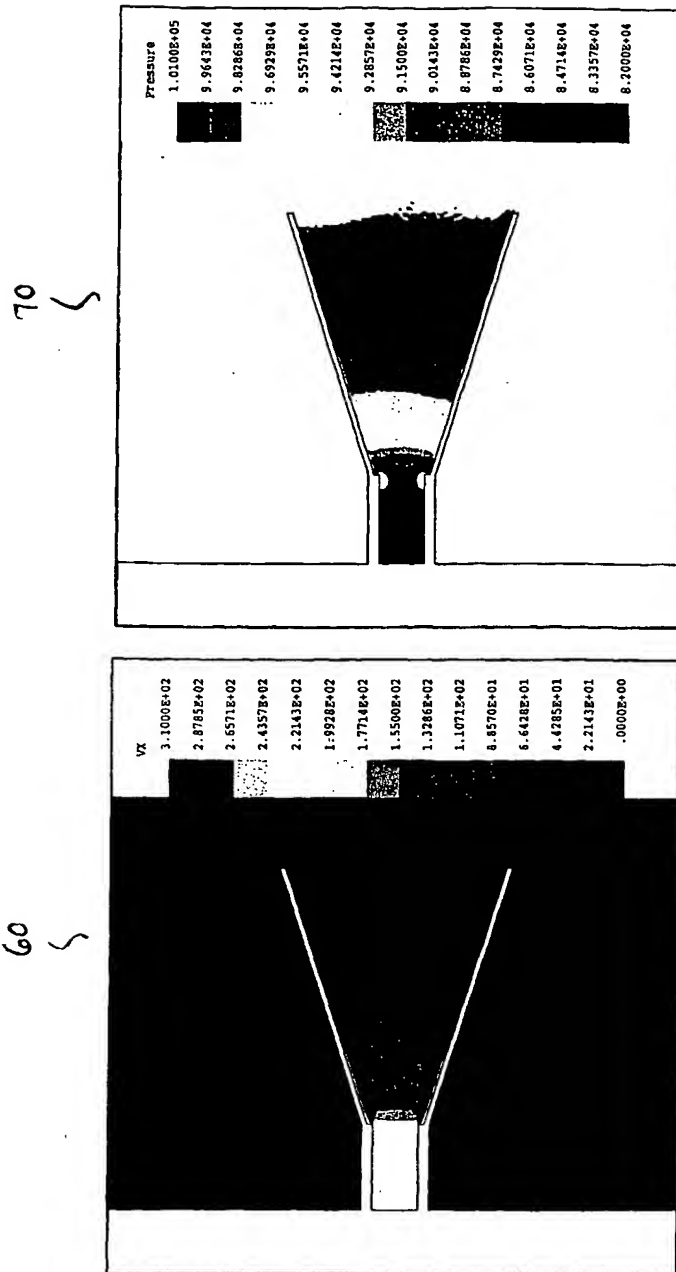


FIG. 3

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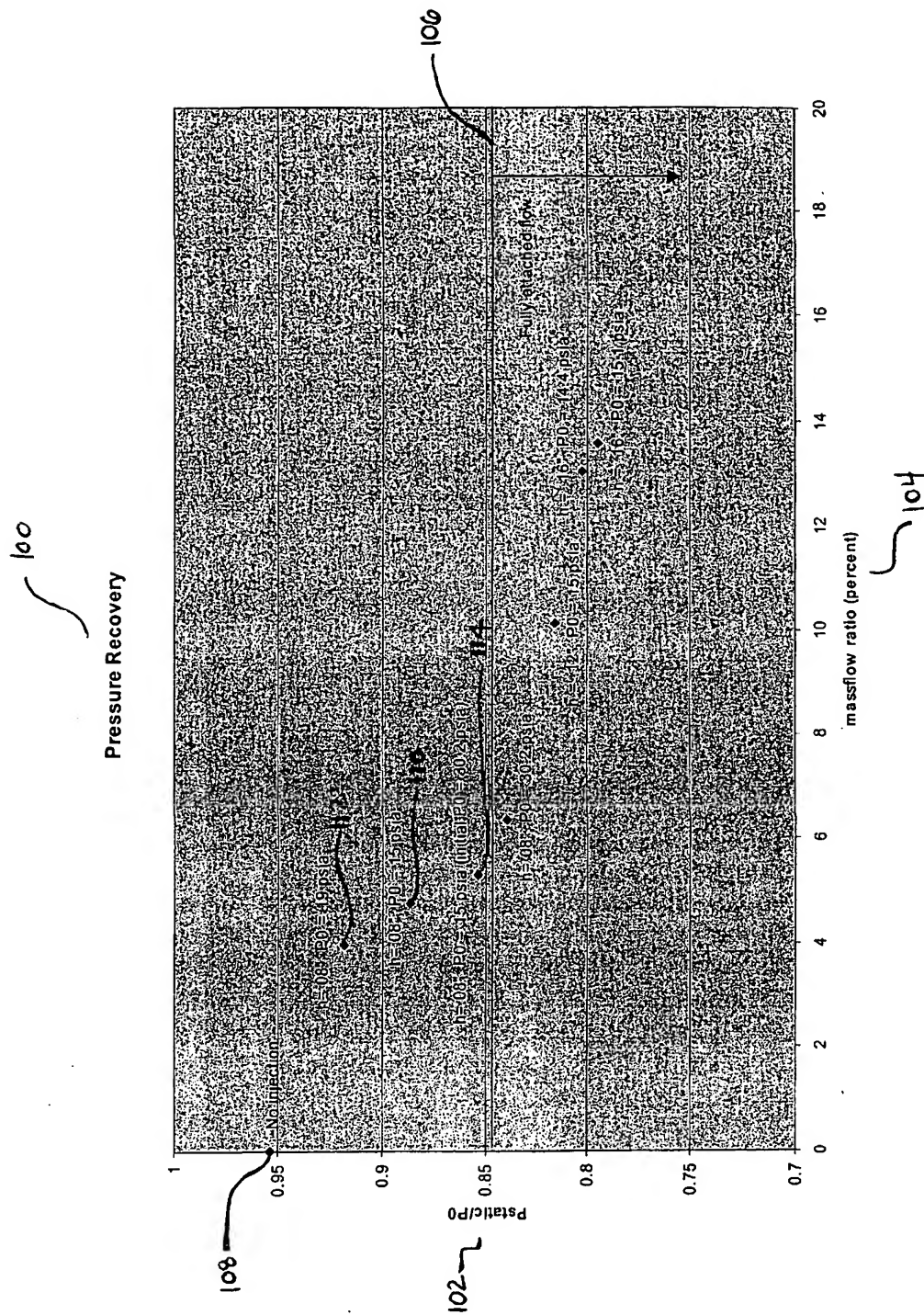
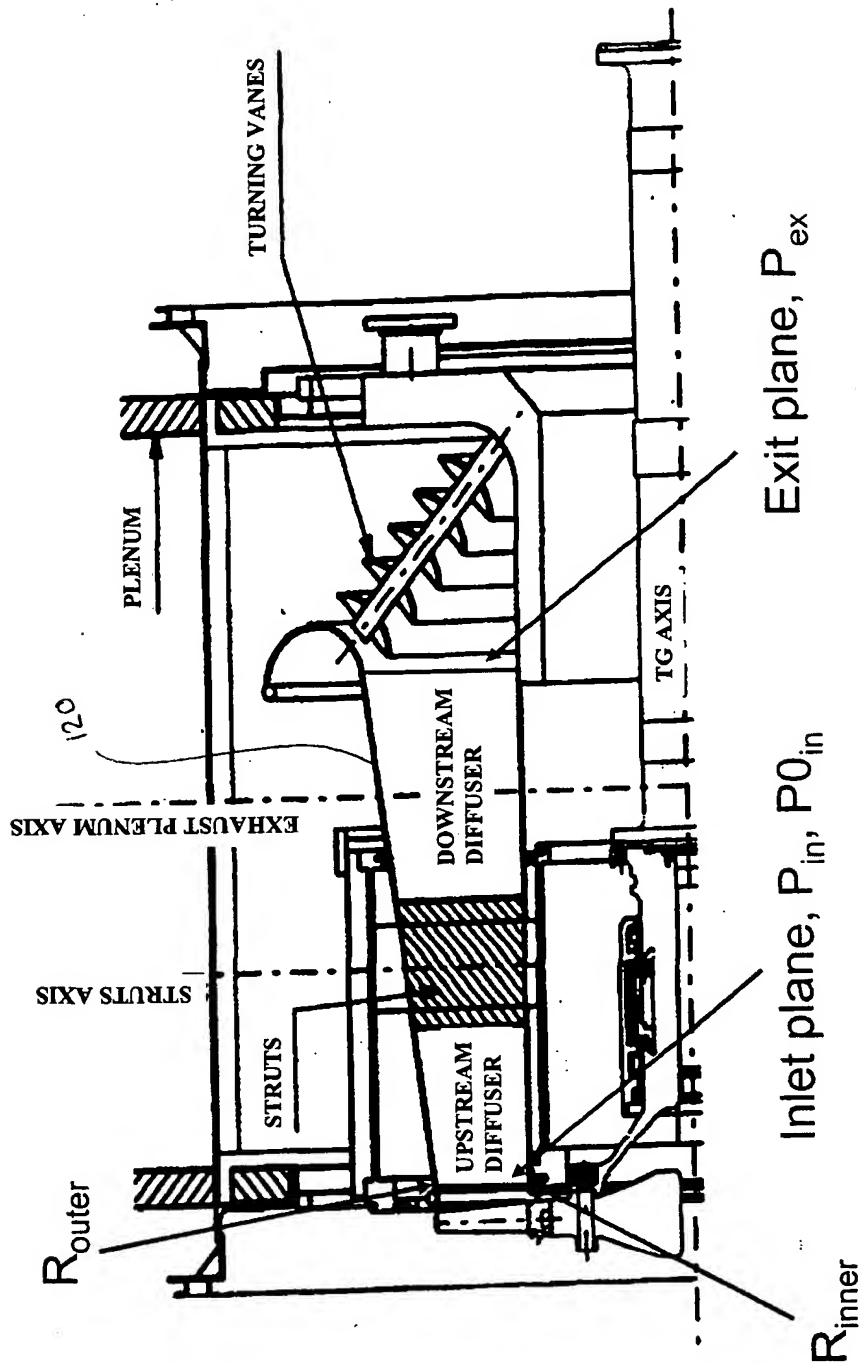


FIG. 4

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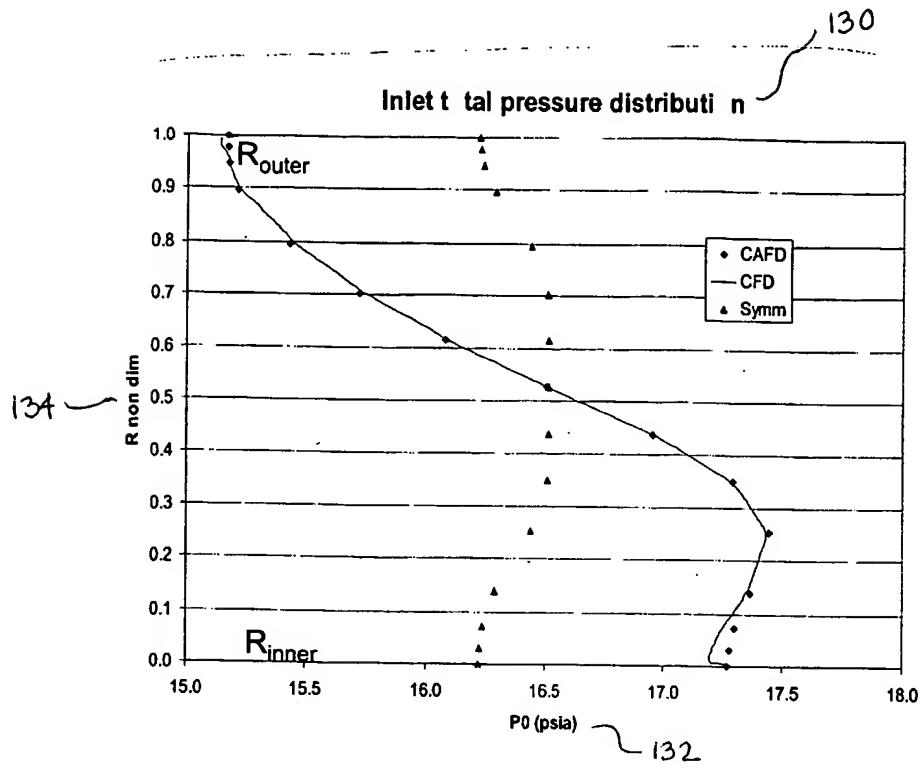


FIG. 6

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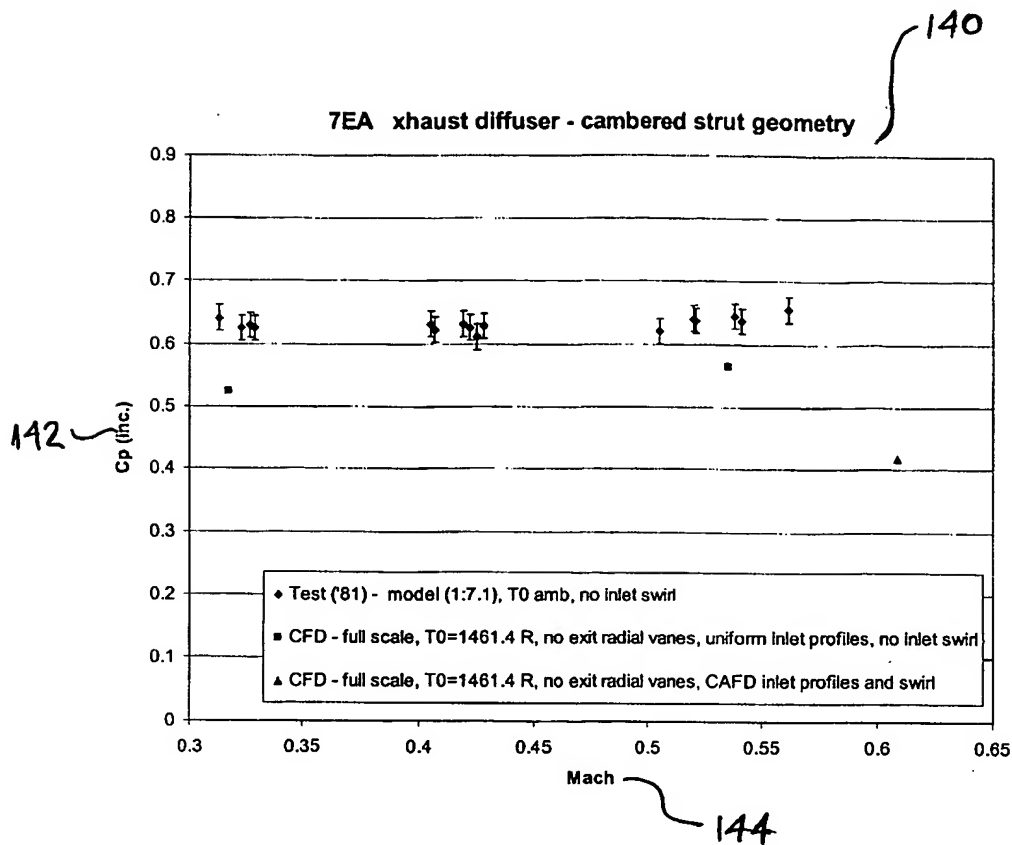
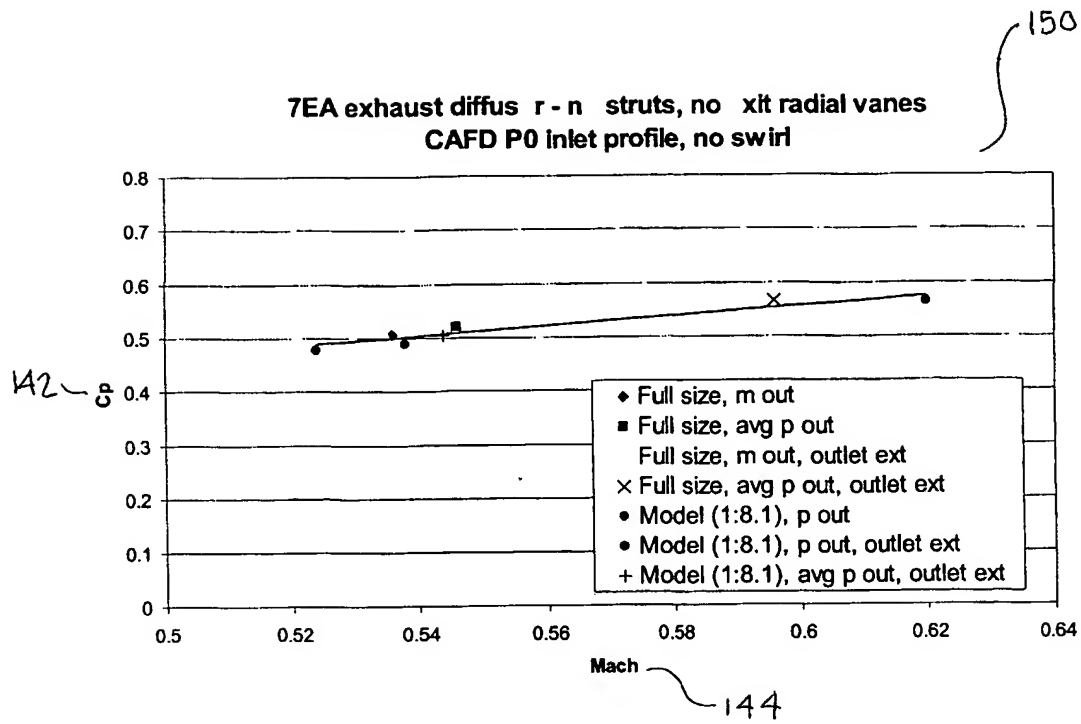


FIG. 7

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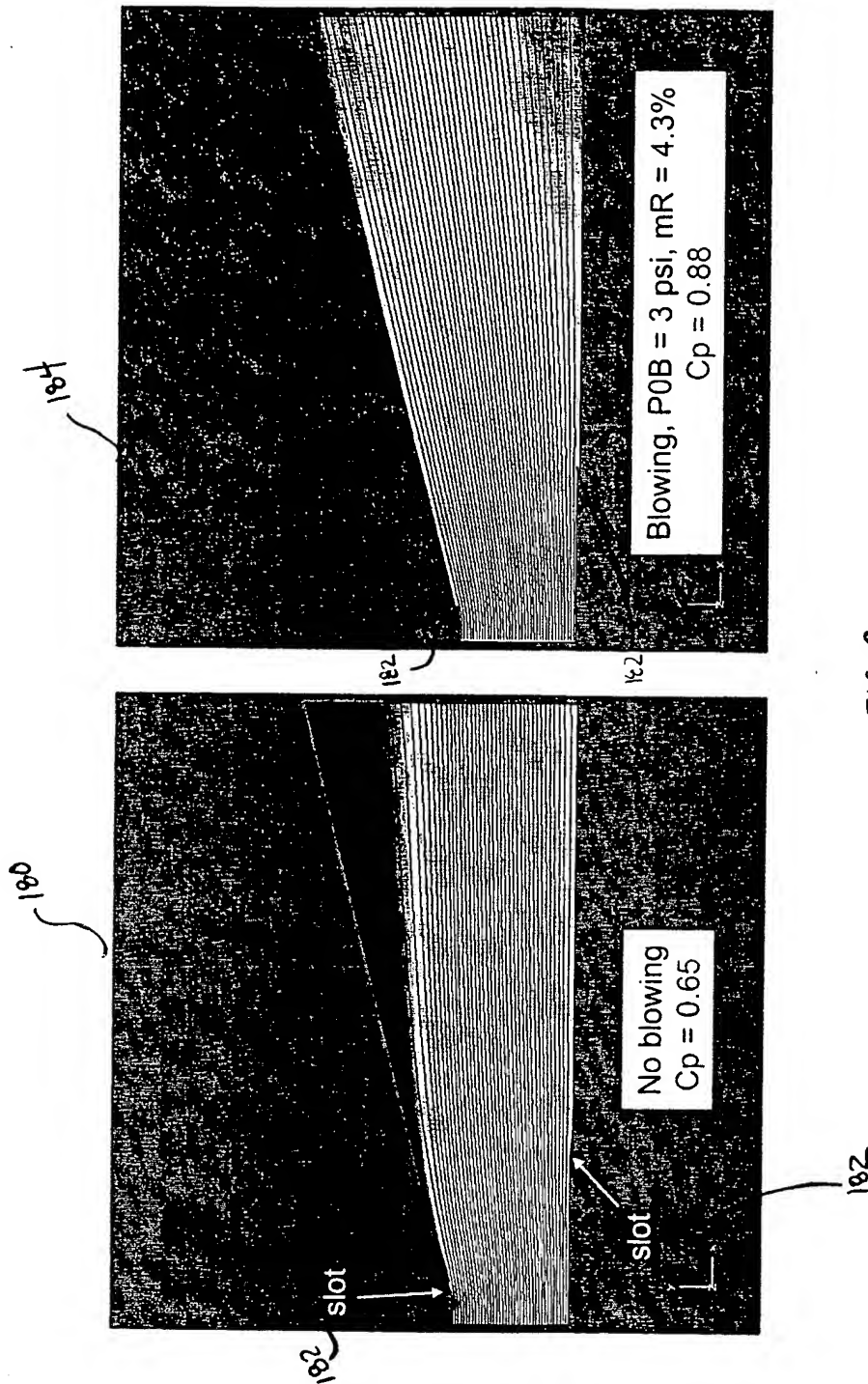
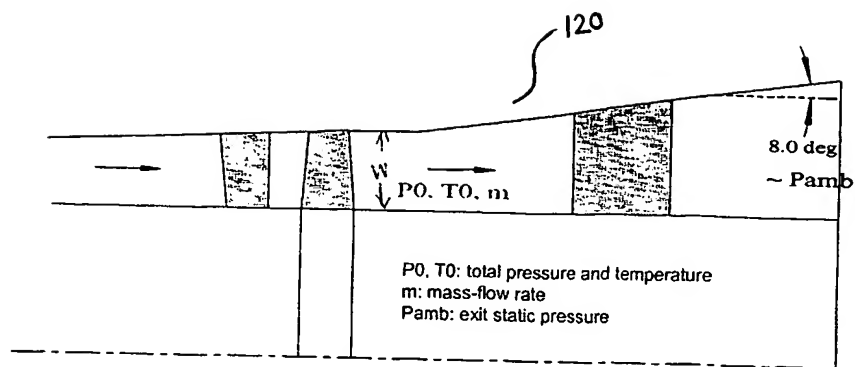


FIG. 9

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Net gain in turbine work
Effects of inlet P0 profile and slot height
(turbine air extraction)

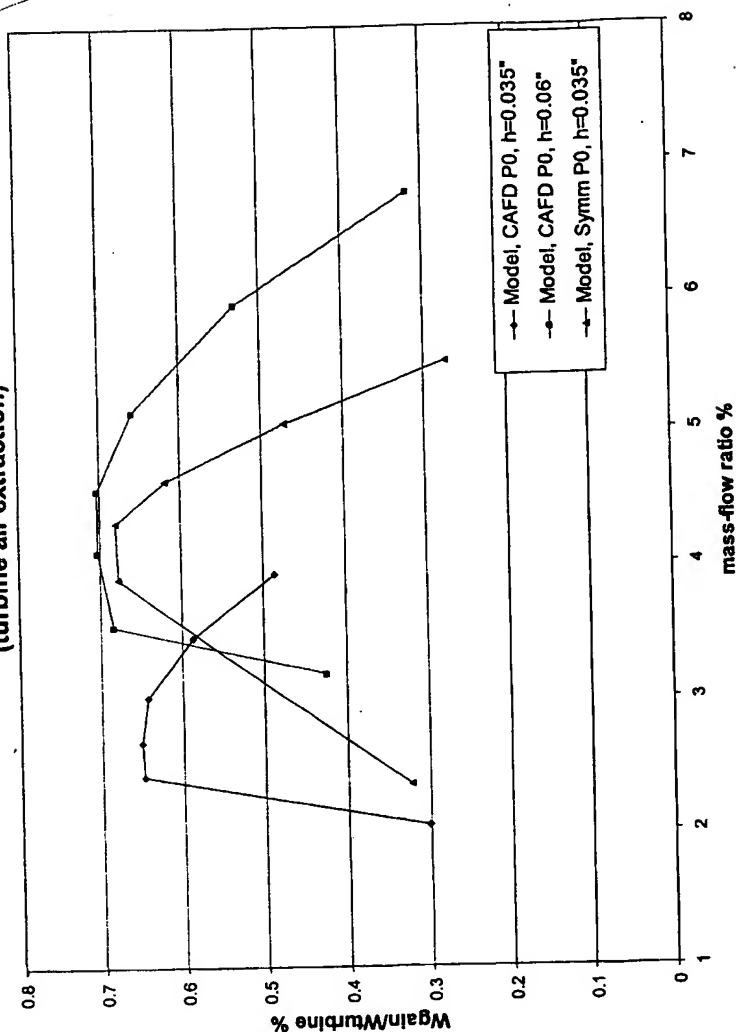


FIG. 12

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- Baseline turbine work

$$W_b = \dot{m} C_p (T_0^i - T_0) = \dot{m} C_p T_0^i \left[1 - \left(\frac{P_0}{P_0^i} \right)^{\frac{\gamma-1}{\gamma}} \right]$$

- Augmented turbine work

$$W_a = \dot{m} C_p (T_0^i - T_0') - \dot{m}_B C_p (T_0^B - T_0') = \dot{m} C_p T_0^i \left[\left[1 - \left(\frac{P_0'}{P_0^i} \right)^{\frac{\gamma-1}{\gamma}} \right] - \frac{\dot{m}_B}{\dot{m}} \left(\frac{P_0^B}{P_0^i} \right)^{\frac{\gamma-1}{\gamma}} \left[1 - \left(\frac{P_0'}{P_0^B} \right)^{\frac{\gamma-1}{\gamma}} \right] \right]$$

- Net turbine work gain (figure of merit)

$$\frac{W_{gain}}{W_{turbine}} = \frac{W_a - W_b}{W_b}$$

FIG. 13

BEST AVAILABLE COPY

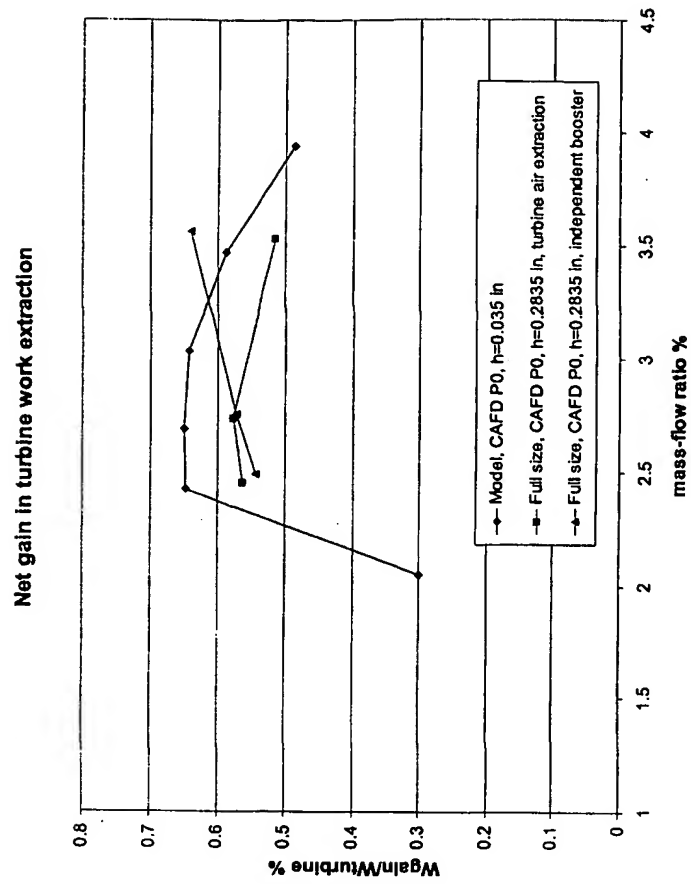


FIG. 15

BEST AVAILABLE COPY

- **Baseline turbine work**

$$W_b = \dot{m} C_p (T_0^i - T_0) = \dot{m} C_p T_0^i \left[1 - \left(\frac{P_0}{P_0^i} \right)^{\frac{\gamma-1}{\gamma}} \right]$$

- **Augmented turbine work**

$$W_a = \dot{m} C_p (T_0^i - T_0') = \dot{m} C_p T_0^i \left[1 - \left(\frac{P_0'}{P_0^i} \right)^{\frac{\gamma-1}{\gamma}} \right]$$

- **Blowing work (booster)**

$$W_B = \dot{m}_B C_p' (T_0^B - T_{amb}) = \dot{m}_B C_p' T_{amb} \left[\left(\frac{P_0^B}{P_{amb}} \right)^{\frac{\gamma-1}{\gamma e_c}} - 1 \right]$$

- **Net turbine work gain (figure of merit)**

$$\frac{W_{gain}}{W_{turbine}} = \frac{W_a - W_B - W_b}{W_b}$$

FIG. 16

BEST AVAILABLE COPY

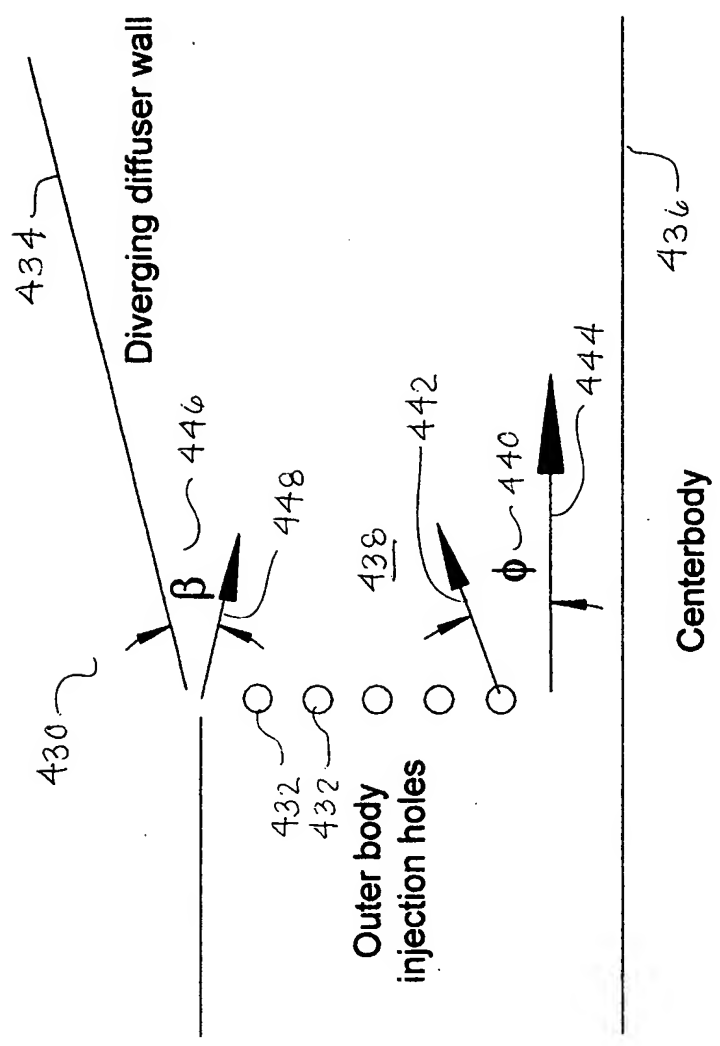


Fig. 17

BEST AVAILABLE COPY

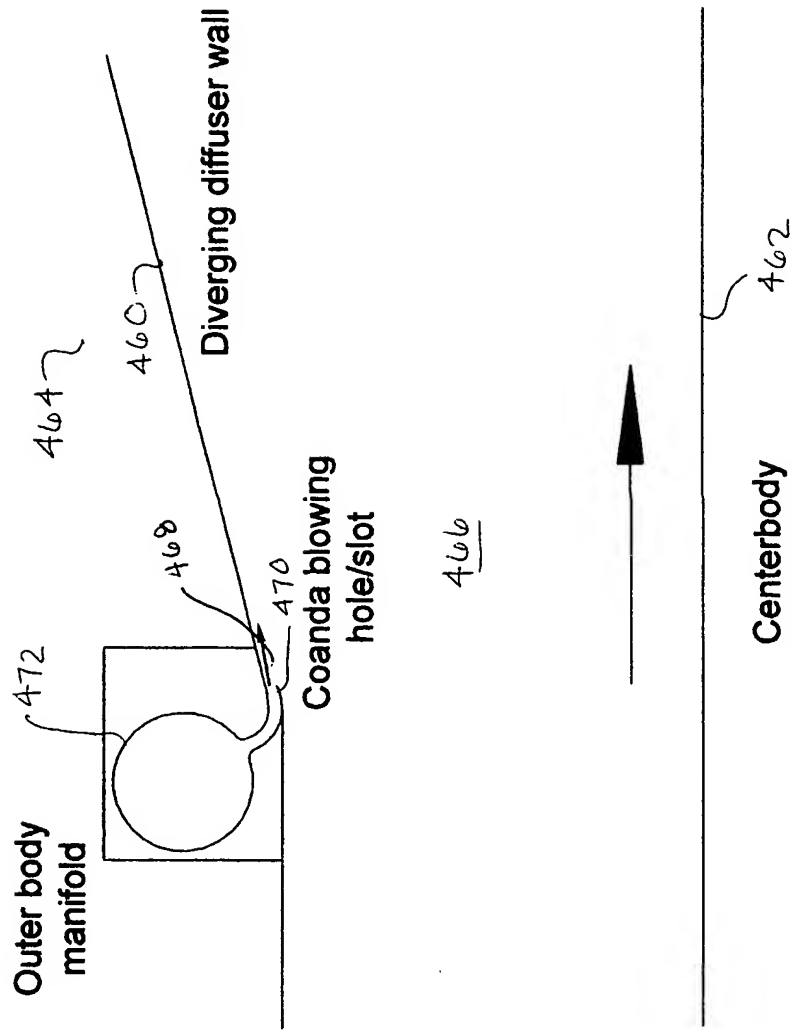


Fig. 18

BEST AVAILABLE COPY

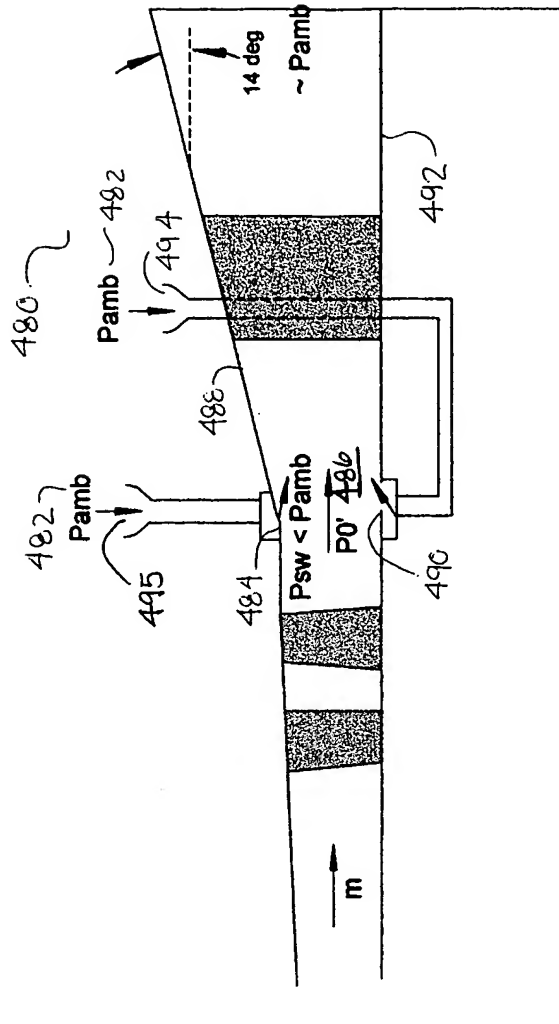


Fig. 19

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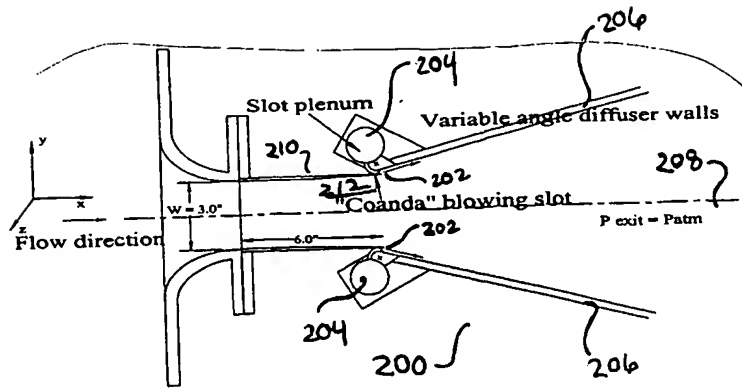


FIG. 20

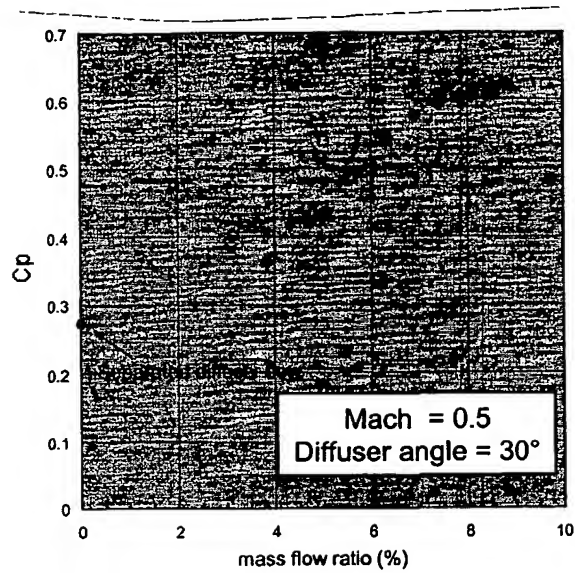
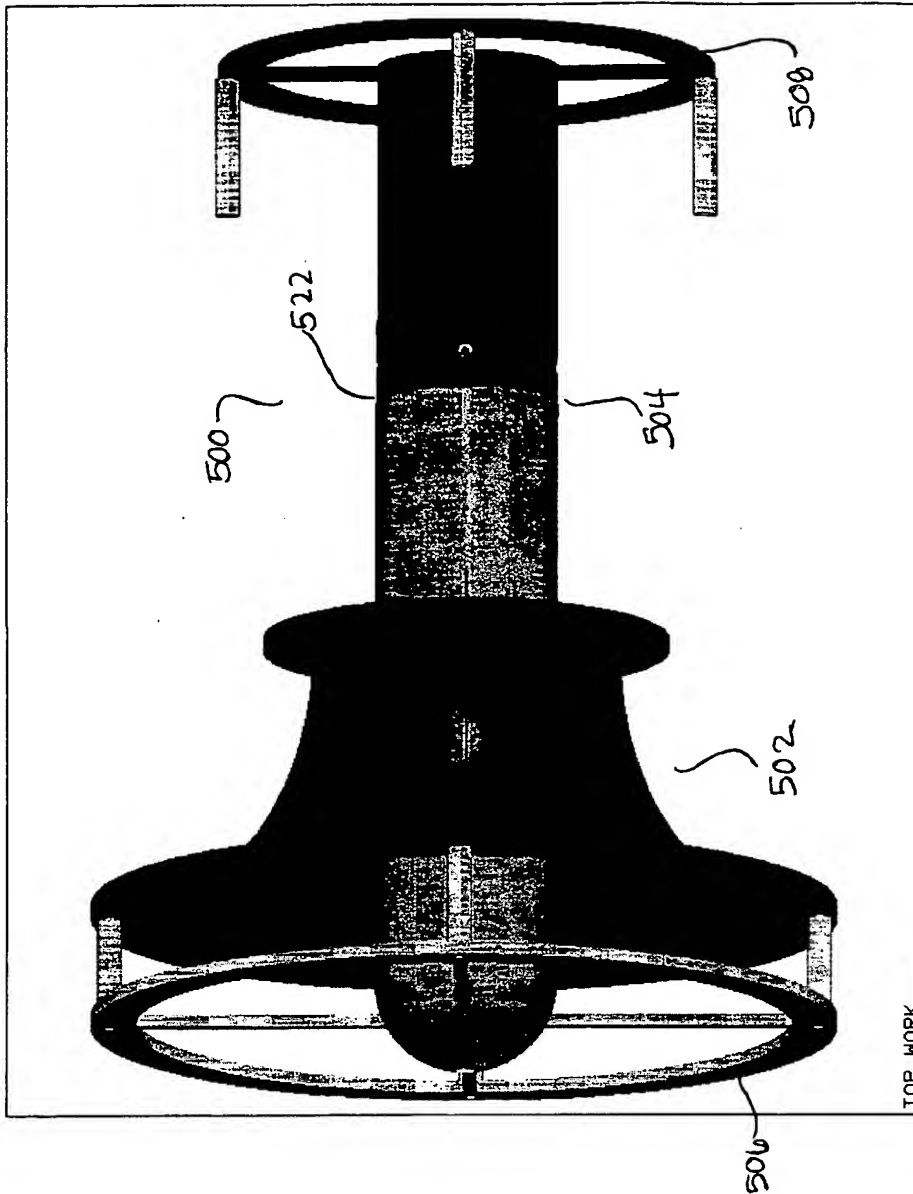


FIG. 21

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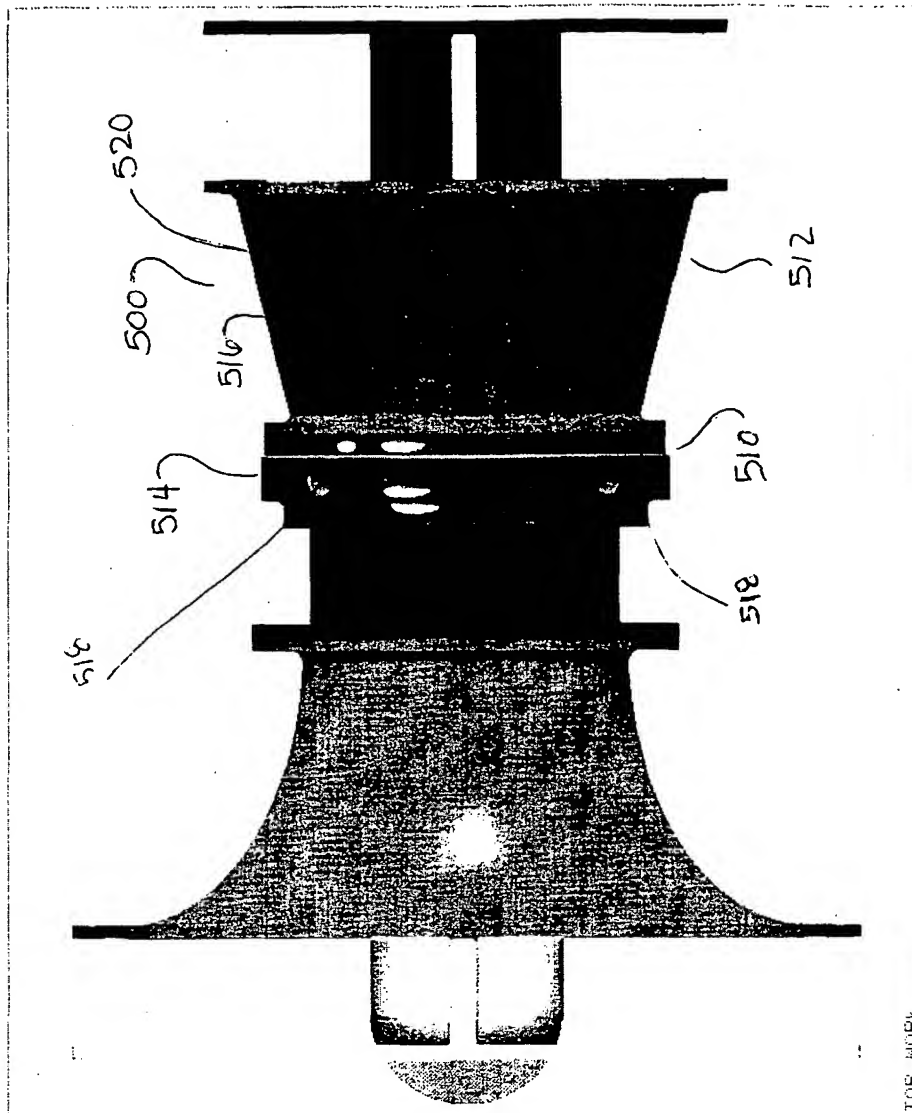


FIG. 23

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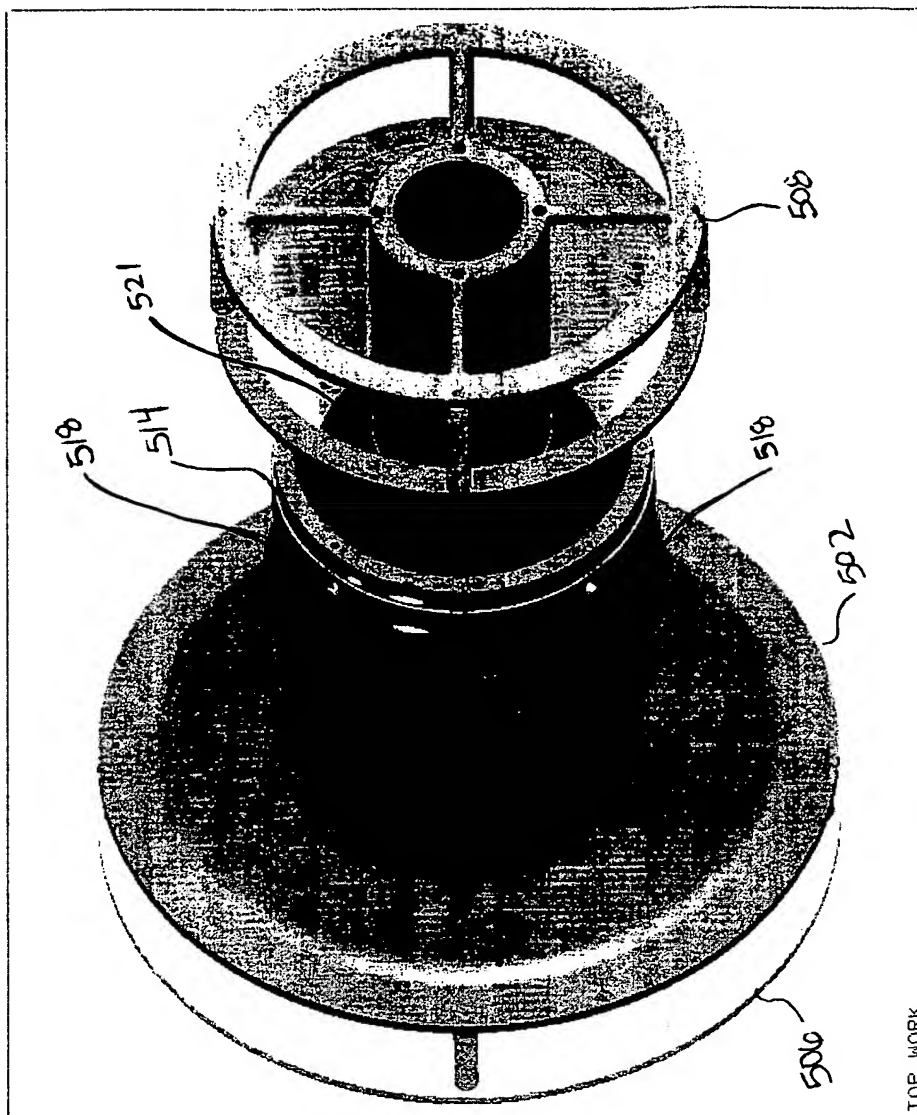


FIG. 2A

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7EA GT annular exhaust diffuser model with inlet blowing

540

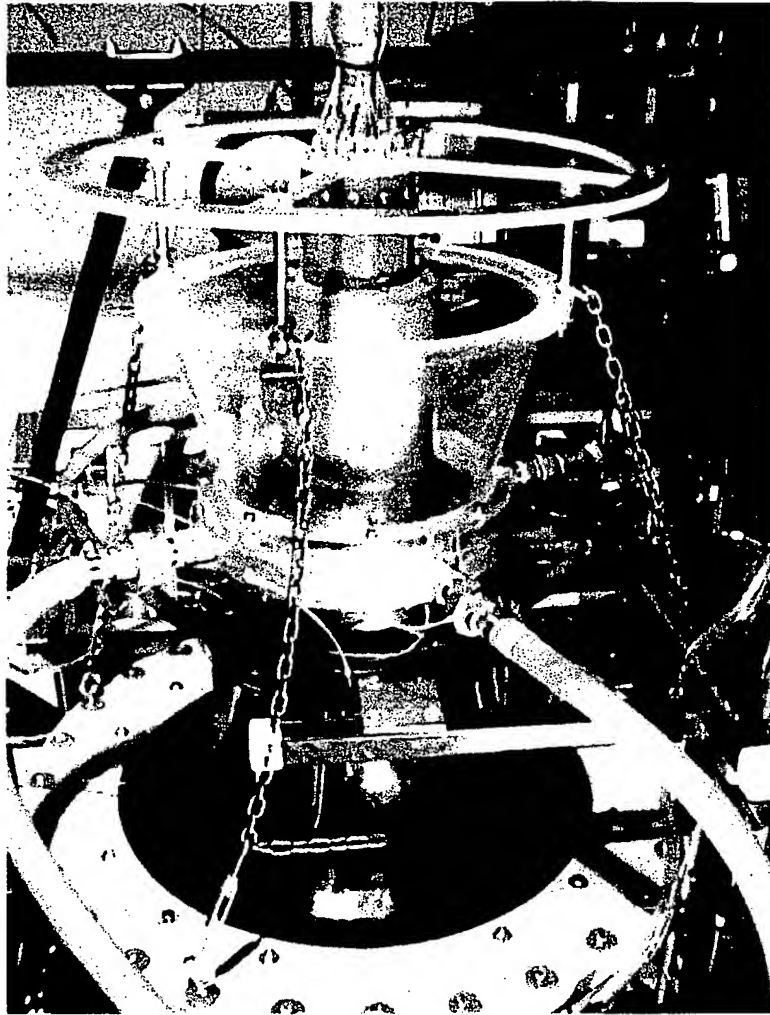


Fig. 25

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14 deg geometry, no struts, no radial vanes

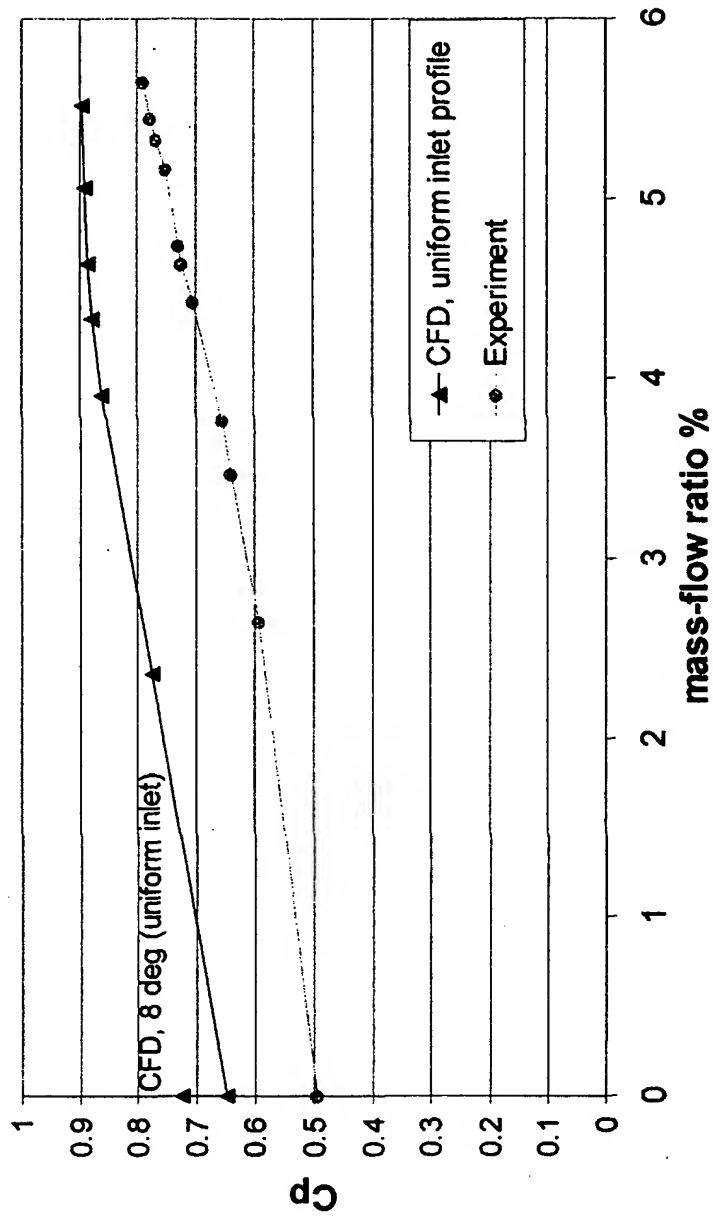
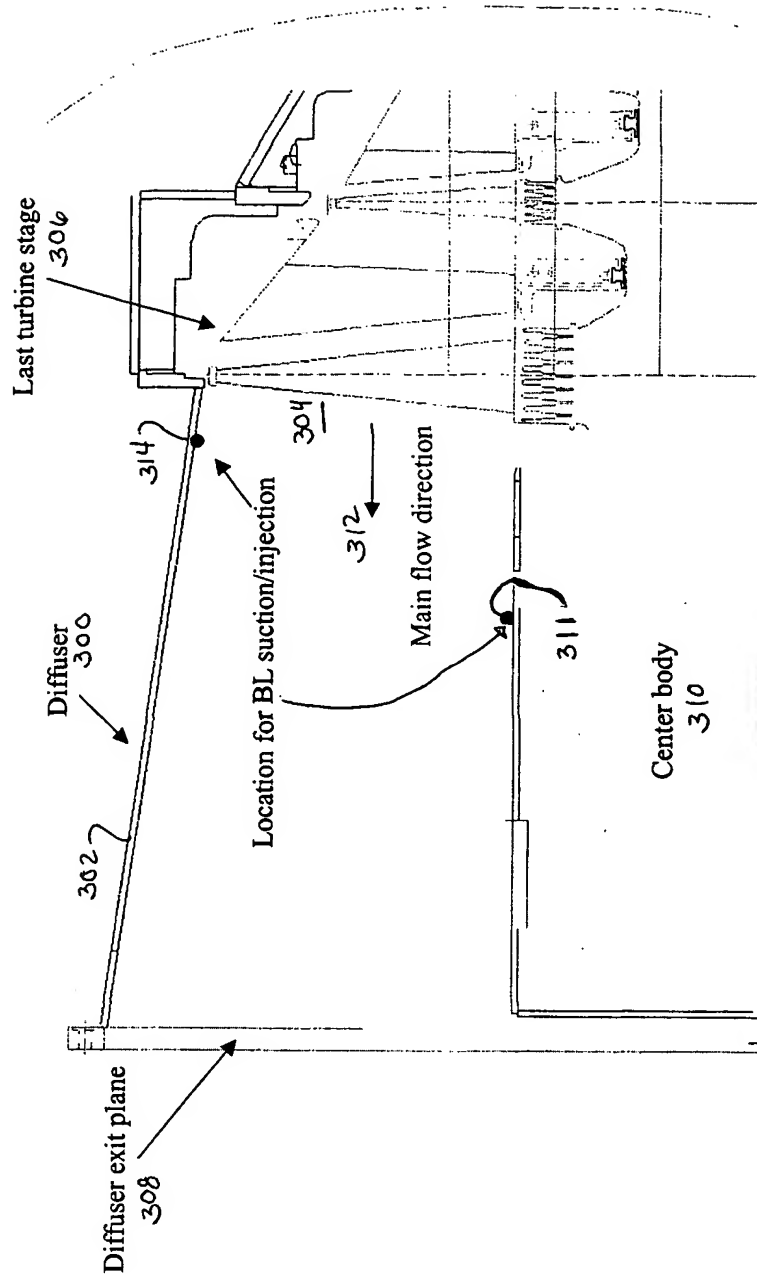


Fig. 26

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Schematic of ST Axial-Flow Diffuser - A10

FIG. 27

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